

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
)	
Kurt E. Spears)	
)	Group Art Unit: To Be Assigned
Serial No.: To Be Assigned)	
)	Examiner: To Be Assigned
Filed: Herewith)	
)	Docket No.: 10004092-5

For: **PHOTOSENSOR ASSEMBLY WITH SHARED STRUCTURES**

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

In regard to the above-referenced application, Applicants submit the following preliminary amendments and remarks to be respectively entered and considered prior to examination.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 08-2025.

AMENDMENTS

Please enter the following amendments:

In the Specification

Please add the following paragraph beginning on page 1, line 5:

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation application, which is based on and claims priority to U. S. Utility Patent Application 09/703,960, filed on October 31, 2000, and which is incorporated herein in its entirety.

Please substitute the following paragraph for the paragraphs indicated:

For the paragraph beginning at page 5, line 2, substitute the following paragraph:

An embodiment of a photosensor assembly comprises first through sixth arrays of photosensor elements and first through third arrays of charge shift registers. Each photosensor element in the first array, the third array and the sixth array of photosensor elements exhibit a first size, and each photosensor element in the second array, the fourth array and the sixth array of photosensor elements exhibit a size different than the first size. The first and second arrays of photosensor elements are operative to detect a first color of light, the third and fourth arrays of photosensor elements are operative to detect a second color of light, and the fifth and sixth arrays of photosensor elements are operative to detect a third color of light. The first array of charge shift registers is coupled between the first and second arrays of photosensor elements and is operative to receive charges therefrom. The second array of charge shift registers is coupled between the third and fourth arrays of photosensor elements and is operative to receive charges therefrom. The third array of charge shift registers is coupled between the fifth and sixth arrays of photosensor elements and is operative to receive charges therefrom.

In the Abstract

For the paragraph beginning at page 23, line 2, substitute the following paragraph:

A representative photosensor assembly comprises first through sixth arrays of photosensor elements and first through third arrays of charge shift registers. Each photosensor element in the first array, the third array and the sixth array of photosensor elements exhibit a first size, and each photosensor element in the second array, the fourth array and the sixth array of photosensor elements exhibit a size different than the first size. The first and second arrays of photosensor elements are operative to detect a first color of light, the third and fourth arrays of photosensor elements are operative to detect a second color of light, and the fifth and sixth arrays of photosensor elements are operative to detect a third color of light. The first, second and third arrays of charge shift registers are coupled between the first and second, third and fourth, and fifth and sixth arrays of photosensor elements, respectively. Each of the arrays charge shift registers are operative to receive charges from the arrays of photosensor elements to which they are coupled.

In the Claims

Please cancel claims 1 - 14 without waiver, disclaimer or prejudice.

Please add the following claims:

1 15. (Newly Added) A photosensor assembly comprising:
2 a first array, a third array and a sixth array of photosensor
3 element in the first array, the third array and the sixth array of photosensor elements exhibiting a
4 first size;
5 a second array, a fourth array and a sixth array of photosensor elements, each
6 photosensor element in the second array, the fourth array and the sixth array of photosensor
7 elements exhibiting a size different than the first size;
8 the first array and the second array of photosensor elements operative to detect a first
9 color of light, the third array and the fourth array of photosensor elements operative to detect a
10 second color of light, and the fifth array and the sixth array of photosensor elements operative to
11 detect a third color of light;
12 a first array of charge shift registers coupled between the first array and second array of
13 photosensor elements and operative to receive charges therefrom;
14 a second array of charge shift registers coupled between the third array and fourth array
15 of photosensor elements and operative to receive charges therefrom; and
16 a third array of charge shift registers coupled between the fifth array and sixth array of
17 photosensor elements and operative to receive charges therefrom.

1 16. (Newly Added) The photosensor assembly of claim 15, further comprising:
2 a fourth array of charge shift registers coupled between the second array and third array
3 of photosensor elements and operative to receive charges therefrom.

1 17. (Newly Added) The photosensor assembly of claim 16, further comprising:
2 a fifth array of charge shift registers coupled between the fourth array and fifth array of
3 photosensor elements and operative to receive charges therefrom.

1 18. (Newly Added) The photosensor assembly of claim 16, further comprising:
2 a first charge transfer register coupled to the second array and fourth array of charge shift
3 registers; and
4 an amplifier coupled to the first charge transfer register and operative to receive charges
5 therefrom,
6 the first charge transfer register being operative to transfer charges to at least the
7 amplifier such that, in a first mode, the first charge transfer register provides unmodified charges
8 from the second array and fourth array of charge shift registers to at least the amplifier.

1 19. (Newly Added) The photosensor assembly of claim 16, further comprising:
2 a first charge transfer register coupled to the second array and fourth array of charge shift
3 registers; and
4 an amplifier coupled to the first charge transfer register and operative to receive charges
5 therefrom,
6 the first charge transfer register being operative to transfer charges to at least the
7 amplifier such that, in a second mode, the first charge transfer register adds charges from the
8 second array of charge shift registers to the charges of the fourth array of charge shift registers
9 and provides the charges added to at least the amplifier.

1 20. (Newly Added) The photosensor assembly of claim 16, further comprising:
2 a first charge transfer register coupled to the second array and fourth array of charge shift
3 registers; and
4 an amplifier coupled to the first charge transfer register and operative to receive charges
5 from the first charge transfer register,
6 the first charge transfer register being operative to transfer charges to at least the
7 amplifier such that, in a third mode, the first charge transfer register alternately provides charges
8 from the second array and the fourth array of charge shift registers to at least the amplifier.

1 21. (Newly Added) The photosensor assembly of claim 16, wherein each of the photosensor
2 elements of the third array of photosensor elements is operative to transfer charges selectively to
3 multiple ones of the charge shift registers of both the second array and fourth array of charge
4 shift registers such that, in a low-speed, high resolution scanning mode, the photosensor
5 elements of the third array of photosensor elements transfer charges to multiple ones of the
6 charge shift registers of each of the second and fourth arrays of charge shift registers.

1 22. (Newly Added) The photosensor assembly of claim 16, wherein each of the photosensor
2 elements of the third array of photosensor elements is operative to transfer charges selectively to
3 multiple ones of the charge shift registers of both the second array and fourth array of charge
4 shift registers such that, in a high-speed, low-resolution scanning mode, the photosensor
5 elements of the third array of photosensor elements transfer charges to only one charge shift
6 register of the second and fourth arrays of charge shift registers.

1 23. (Newly Added) The photosensor assembly of claim 22, wherein the fourth array of the
2 photosensor elements array includes a pair of linear arrays of photosensor elements, each of the
3 photosensor elements of one of the linear arrays of the fourth array of photosensor elements
4 being operative to transfer charges only to a corresponding one of the charge shift registers of
5 the second array of charge shift registers.

1 24. (Newly Added) The photosensor assembly of claim 15, wherein each of the photosensor
2 elements of the third array of photosensor elements is approximately four times as large as each
3 of the photosensor elements of the one of the linear arrays of the fourth array of photosensor
4 elements.

1 25. (Newly Added) The photosensor assembly of claim 15, wherein each of the photosensor
2 elements of the third array of photosensor elements and each of the photosensor elements of the
3 one of the linear arrays of the fourth array of photosensor elements is operative to detect only
4 the second color of light.

1 26. (Newly Added) The photosensor assembly of claim 15, wherein each of the photosensor
2 elements in the second array, fourth array and sixth array of photosensor elements is smaller in
3 size than the first size.

1 27. (Newly Added) The photosensor assembly of claim 15, wherein each of the photosensor
2 elements of the first array, third array and fifth array of photosensor elements is operative to
3 transfer charges to multiple ones of the charge shift registers of the first array, second array and
4 third array of charge shift registers, respectively.

28. (Newly Added) The photosensor assembly of claim 15, wherein each of the second array, fourth array and sixth array of photosensor elements includes a pair of linear arrays of photosensor elements, the linear arrays of each pair being staggered with respect to each other.

REMARKS

Upon entry of the amendments herein, claims 15-28 remain pending in the application. In particular, Applicants have added claims 15-28, and have canceled claims 1 - 14 without prejudice, waiver, or disclaimer. Applicants have canceled claims 1 - 14 merely to reduce the number of disputed issues and to facilitate early allowance and issuance of other claims in the present application. Applicants reserve the right to pursue the subject matter of these claims in a continuing application, if Applicants so choose, and do not intend to dedicate the canceled subject matter to the public.

Applicants believe that the amendments add no new matter to the application. Applicants respectfully assert that the amended claims clearly and patentably define over the references discovered in the pre-examination search. Accordingly, favorable consideration and allowance of the present application are hereby courteously requested. In this regard, a telephonic conference to expedite the examination of this matter is respectfully requested. The Examiner is invited to call, at his/her earliest convenience, the undersigned attorney at (770) 933-9500.

Respectfully submitted,



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**ANNOTATED VERSION OF MODIFIED TITLE/SPECIFICATION/ABSTRACT TO
SHOW CHANGES MADE**

The following is a marked up version of the amended claims, wherein bracketing denotes deletions and underlining denotes additions.

In the Specification

Beginning at page 1, line 5:

[A photosensor assembly has at least one line array of photosensors with a first sensor size, and at least one line array of photosensors with a second sensor size, with the two sizes being different. In the example embodiments, for every band of wavelengths being sensed, there are two line arrays of sensors, with one line array having relatively small sensor areas and the other line array having relatively large sensor areas. The line arrays with relatively small sensor areas are used for high native input sampling rates, and the line arrays with relatively large sensor areas are used for high color accuracy and speed. To minimize cost and circuit area, each line array of sensors having large sensor areas shares a charge shift register with a line array of sensors having small sensor areas. If lateral overflow drains are present, some pairs of sensor line arrays may also share overflow drains.]

An embodiment of a photosensor assembly comprises first through sixth arrays of photosensor elements and first through third arrays of charge shift registers. Each photosensor element in the first array, the third array and the sixth array of photosensor elements exhibit a first size, and each photosensor element in the second array, the fourth array and the sixth array of photosensor elements exhibit a size different than the first size. The first and second arrays of photosensor elements are operative to detect a first color of light, the third and fourth arrays of photosensor elements are operative to detect a second color of light, and the fifth and sixth arrays of photosensor elements are operative to detect a third color of light. The first array of charge shift registers is coupled between the first and second arrays of photosensor elements and

is operative to receive charges therefrom. The second array of charge shift registers is coupled between the third and fourth arrays of photosensor elements and is operative to receive charges therefrom. The third array of charge shift registers is coupled between the fifth and sixth arrays of photosensor elements and is operative to receive charges therefrom.

In the Abstract:

Beginning at page 23, line 2:

[A photosensor assembly has at least one line array of photosensors with a first sensor size, and at least one line array of photosensors with a second sensor size, with the two sizes being different. In an example embodiment, for every band of wavelengths being sensed, there are two line arrays of sensors, with one line array having relatively small sensor areas and the other line array having relatively large sensor areas. The line arrays with relatively small sensor areas are used for high native input sampling rates, and the line arrays with relatively large sensor areas are used for high color accuracy and speed. To minimize cost and circuit area, each line array of sensors having large sensor areas shares a charge shift register with a line array of sensors having small sensor areas. If overflow drains are present, some pairs of sensor line arrays may also share overflow drains.]

A representative photosensor assembly comprises first through sixth arrays of photosensor elements and first through third arrays of charge shift registers. Each photosensor element in the first array, the third array and the sixth array of photosensor elements exhibit a first size, and each photosensor element in the second array, the fourth array and the sixth array of photosensor elements exhibit a size different than the first size. The first and second arrays of photosensor elements are operative to detect a first color of light, the third and fourth arrays of photosensor elements are operative to detect a second color of light, and the fifth and sixth arrays of photosensor elements are operative to detect a third color of light. The first, second

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and third arrays of charge shift registers are coupled between the first and second, third and fourth, and fifth and sixth arrays of photosensor elements, respectively. Each of the arrays charge shift registers are operative to receive charges from the arrays of photosensor elements to which they are coupled.